



Essay

Military Assistance to Ukraine and Its Significance in the Russo-Ukrainian War

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Abstract: The interest of social sciences in the military dates back ages, and currently, special attention is being paid to Russia's war in Ukraine. The present paper also follows this research trend, and it intends to analyze both the tactical and operational levels of war by investigating how the military assistance provided by Western states and international organizations to Ukraine is influencing the course of the Russo-Ukrainian war. Subsequently, the paper studies the military assistance in all three phases of the war, beginning from the invasion of Crimea, through the Donbas offensive, to the phase of Ukrainian counter-offensives. The research method used by this paper was to review and synthesize the existing but scarce and sometimes disinformative literature. The findings suggest that Western military aid began cautiously by providing only non-lethal, defensive weapons, but it was of crucial importance in the second phase of the war by guaranteeing heavy weaponry. The paper concludes that Western military assistance, especially from the United States, United Kingdom, Poland, and Germany, has had a significant role in the Russo-Ukrainian war, without which Ukrainian forces may not have persisted to now.

Keywords: military assistance; Russo-Ukrainian war; weapons; western countries



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1. Introduction

The interest of social sciences in military issues has a long history (Molendijk and Kalkman 2023) due to their impact on almost all fields of social sciences, e.g., society, the economy, politics, and diplomatic relations between participating states. Research into the military in social science disciplines, therefore, has focused mainly on the impact of military operations and wars upon humans and society as a whole (Salvatore and Taniguchi 2021; Pickering and Kisangani 2006; Modell and Haggerty 1991), human and social challenges inflicted by the war (Rizk 2021; Caforio 2009) or military settings (Trut et al. 2022), as well as their impact on the economy and economic growth (Mardones 2022; Kentor and Kick 2008). However, current trends show that research interest has turned towards the operational level of military issues (Danielsson 2022; Jobbágy 2010). Thus, recent papers have dealt with campaigns related to military actions as well as major operations to achieve military objectives. This paper follows this trend and places the analytical focus on operational as well as tactical levels, investigating how the military assistance provided by Western countries and international organizations to Ukraine has affected the course of Russia's war in Ukraine or Russia's special military operations in Ukraine, as described by Russia itself. Nevertheless, the paper does not attempt to analyze the strategic level of the war, because it has been declared only by Ukraine, and Russia to some extent.

The rationale behind the paper is that since Russia first seized Crimea from Ukraine and destabilized the Donbas region in 2014, a major question confronting Western nations' decision-makers as well as those of some international organizations has been whether to provide military assistance to Ukraine, and if so, what sort. "This policy debate intensified

when Russia massed its military forces near Ukraine in 2021 and then launched its full-scale invasion of Ukraine on 24 February 2022" (Lanoszka and Becker 2023, p. 1). Nevertheless, presenting an overview of these debates goes beyond the scope of this paper, even if it could give additional depth, since the focus of the paper is the effects of the military assistance not the reasons for providing it.

Despite the initial debates, the member states of the North Atlantic Treaty Organization (henceforth NATO) have provided assistance to Ukraine since 2014, which has continued during the current war and progressed from non-lethal aid to heavy weaponry within nine years. This military assistance to Ukraine, therefore, has had a significant impact on the Russo-Ukrainian war. Many of these Western weapon systems are considered to be 'game changers' for winning the war for Ukraine. However, the question arises if there is a basis for these claims. Did these NATO weapon systems have a profound role in swaying the war, and if they did, was there a single system dominant enough to wear the mantle of 'game changer'?

The purpose of this paper is to find answers to the above research questions by showcasing some of the more prominent weapon systems in chronological order starting from 2014 up to the Russo-Ukrainian war, split into three distinctive phases. The capabilities of the weapon systems are introduced and their use in the war is explained in the paper. Each of the showcased systems is evaluated on the magnitude of its impact on the battlefield.

Bearing in mind that the topic to be investigated in this paper is related to ongoing operations, the findings presented are only based on secondary research conducted by means of reviewing and synthesizing the existing but scarce and sometimes disinformative literature. Consequently, the paper relies heavily on the latest sources of literature, including scientific articles, essays, journal and newspaper articles, and podcasts, and intends to provide insight on the military assistance to Ukraine as well as the 'game changer' weapons based on this research method.

2. Russia's War in Ukraine and the Significance of Military Assistance to Ukraine

Although Russia is a signatory to the 1994 Budapest Memorandum with Ukraine, which provided security assurances against the "threat or use of force against the territorial integrity or political independence of Ukraine" (Anonymous 1994, p. 3), including respect for its sovereignty and existing borders (Mills 2022, p. 1) in exchange for Ukraine joining the Treaty on the Non-Proliferation of Nuclear Weapons by giving all nuclear weapons stationed in their territory to Russia, Russia was not deterred from starting military operations in Ukraine. Russia's war in Ukraine has three distinctive phases, each characterized by the weapon systems provided by Western powers.

2.1. Phase 1: Invasion

Ukraine plays a major role in European politics as a once independent buffer state between NATO and Russia. In 2013, after many years of alignment with the European Union (henceforth EU), a chain of protests known as Euromaidan swept through the country after pro-Russian president Viktor Yanukovich decided to not sign the European Union-Ukraine Association Agreement, thus inching the country towards Russia (Käihkö 2021). The protests soon turned into the Revolution of Dignity, successfully overthrowing Viktor Yanukovich. Russia reacted to the revolution by occupying Crimea with a military force and annexing it. The reason behind Russia's use of force was NATO's expansion into Eastern Europe (Shehadi 2022). For Russian national interest, it was absolutely necessary to keep Ukraine neutral, at minimum, and to make it an ally by installing a pro-Russian government, at maximum. Annexing parts of Ukraine, however, was part of the Novorossiia project planning to gain the following regions: Crimea, where ethnic Russians are an absolute majority, and Southern Ukraine and the Donbas, where ethnic Russians are a considerable demography (Basora and Fisher 2014). Simultaneously, pro-Russian protests started in the Donbas and Luhansk Oblasts, which turned into an armed insurgency that started the Donbas War (Hamilton 2019). Fearing further Russian expansion, the United

States of America (henceforth USA) provided the first package of military assistance to Ukraine (Lanoszka and Becker 2023).

The Barack Obama administration supported Ukraine with a total of USD 600 million in non-lethal military assistance (Burns et al. 2022). The package included equipment for soldiers, such as body armor, helmets, night vision and thermal imaging devices (U.S. Security Assistance to Ukraine 2023), and support equipment, which included first aid and medical kits as well as communication and engineering equipment (Lanoszka and Becker 2023). An important addition was counter-battery radar to help fight separatist artillery (Lamothe 2015). Infantry Mobility Vehicles (IMVs) as well as 200 unarmored Humvees, of which 30 had add-on armor packages. An unspecified number of Raven Unmanned Aerial Vehicles (UAVs) also found their new home in Ukraine's drone fleet (Lamothe 2015). Tangible assistance aside, the USA provided training for the Armed Forces of Ukraine (Lanoszka and Becker 2023) and hosted the training exercise Operation Trident (Belkin et al. 2014). The reason for sending only non-lethal weapons had more to do with the politics of the Obama administration (e.g., fears of escalation) than the presupposed inability of the Ukrainians to utilize modern military arms (Gollom 2022; Coyle 2017), even though the Ukrainian military was not as developed as it has been since its modernization in late 2014 (Mevlutoglu 2022; Sanders 2017).

The Donald Trump administration was the first to give lethal weapons to Ukraine in 2018 under an arms deal. The reasons for sending lethal weapons were elevated separatist aggression and violation of the Minsk II Agreement by breaking the ceasefire on multiple occasions (Miller 2018). The deal included 37 Javelin launchers and 250 missiles, which was followed by a second deal of 2 launchers and 150 missiles (Martinez et al. 2019). The Javelin was chosen for its anti-tank capability, as separatists fielded Russian armor (Miller 2018). Due to the weapons' defensive nature, their potential to escalate the conflict with Russia was estimated to be low and turned out to be insignificant. Moreover, during the Trump administration, Russia was reluctant to launch a full-scale invasion of Ukraine (Pisano 2022); therefore, anti-armor weapons had only limited usefulness. Beyond that, 300+ missiles meant a negligible quantity that was not enough to change the outcome of this large-scale conflict. However, these Javelins were important as they were the first lethal weapons provided to Ukraine. Donald Trump's government was later rocked by the first impeachment trial after Donald Trump was accused of soliciting election assistance from Ukraine to win the 2020 presidential election. This trial nullified a planned aid package (Fandos and Shear 2021). Military assistance only resumed after Trump was acquitted in 2020, with packages worth USD 250 million (Zengerle 2020).

Joe Biden was a supporter of sending weapons to Ukraine as Vice President under Barack Obama. In 2021, as President, Joe Biden faced escalating conflict from Russia. In the latter half of 2021, Russia started building up military infrastructure around the Ukrainian border and amassed troops in Belarus, Crimea, and mainland Russia. The USA kept up a steady supply of military equipment and Javelins. New packages included small arms, heavy weaponry ammunition, and Counter-Unmanned Aircraft Systems (C-UAS) that disrupt a drone's radio or global positioning system (GPS) guidance (U.S. Department of State 2023). Island Class (Polityuk 2021) and Mark VI patrol boats with training to bolster the Ukrainian Navy, satellite imagery, and support for intelligence and analysis capability were also included (U.S. Department of Defense 2021). By the end of the year, a looming Russian offensive was evident. The start of 2022 was marked by elevated separatist aggression, numerous false flag attacks, and false claims of a future Ukrainian offensive (Bacio Terracino and Matasick 2022). Due to rising tensions, more NATO states, including the United Kingdom (henceforth UK), Germany, and Estonia for instance, decided to provide Ukraine with military assistance (Mills 2022). These newly provided packages only landed a few days before the war started and only included small arms, Anti-Tank (AT) weapons, and Man-Portable Air-Defense Systems (MANPADs) (Stewart and Ali 2022). No heavy weapons or vehicles other than IMVs were provided and the missile launchers were strictly defensive tools against armor and aerial threats (Antezza et al. 2022).

In the early hours of 24 February 2022, Russia launched the full-scale invasion—the so-called ‘special military operation’—of Ukraine, referring to the discrimination and repression of local minorities as ‘casus belli’ (Rossoliński-Liebe and Willems 2022). Ukraine instantly declared general mobilization and vastly increased the number of Territorial Defense Force (TDF) brigades. The TDF system was set up in January in anticipation of the Russian attack. It was a volunteer force tasked with supporting the main army, setting up centers of resistance, and performing partisan attacks in occupied areas. They lacked training and experience, but their knowledge of the land proved to be valuable in setting up ambushes and fighting in urban areas (Flanagan and Kepe 2022). Compared to the Russian army, they were vastly overmatched, but AT weapons and MANPADs greatly leveraged their strength and enabled them to form a capable resistance that offset the losses sustained.

The FGM-148 Javelin proudly stood in the spotlight as the tool to crack all problems that travel on tracks and weigh 50 tons. Ukraine also received a shipment and training for Next-generation Light Anti-Tank Weapons (NLAW) (Ponomarenko 2022a). Although it did not garner as much media attention as the Javelin, its capabilities were not to be belittled. The meter-long disposable NLAW, unlike most light anti-tank weapons, has a Predicted Line of Sight (PLOS) system that gathers data by tracking the target for a short time, and then calculates a prediction for the strike. However, these weapons are highly situational due to their limited range and target selection. Taking this into consideration, NLAWs were not seen as the main supporters of the Ukrainian army from the viewpoint of their defensive potential. On the contrary, FIM-92 Stingers formed the backbone of the air-defense weapons provided by military assistance. This weapon system proved to be an extremely useful tool for Ukrainian forces facing the Russian invasion, particularly when defending against helicopters and gunships. Recent upgrades enabled it to target cruise missiles and smaller UAVs (Raytheon Missiles & Defense n.d.). Poland also chipped in by sending Pioruns, a modernized version of the GROM system based on the Soviet Iгла. This system was important as it made up for the Stinger’s shortcoming of being unable to track super low-flying targets (Reszczyński 2022).

All four of these weapons had good capabilities, but they were not game changers and they were somewhat overrated (Chacko 2022). They proved themselves to be effective in combat, but they did not have a major influence on the war due to their limited numbers, situational use against specific threats, and existing substitutes already in use before the war. Ukrainian air defenses recovered from initial strikes and short range was covered by Soviet-era MANPADs, which were not given due credit, by the way, mainly because of propaganda. After the battle of Hostomel, Russia did not attempt another helicopter assault and Close Air Support (CAS) was limited, meaning air-defense weapons did not see extensive use (Ponomarenko 2022b). Ukraine also had a large stockpile of Soviet-era AT weapons and their in-house-developed Stugna Anti-Tank Guided Missile (ATGM) system, which had longer range and could be fired remotely (Eastwood 2022).

Russia realized that they were unable to complete their war goals, although they stated that the first phase of the military operation was almost complete, so they set out a new narrative: the goal of the war became securing and ‘liberating’ the Donbas (Donetsk and Luhansk Oblast). With this goal, they began rotating troops from the Kyiv axis to the Donbas axis in April (Trevelyan and Winning 2022). The Kyiv axis was completely abandoned and the objective of capturing Kharkiv was cancelled, but Russian forces held their positions (Clark et al. 2022a).

Ukraine succeeded in maintaining its existence and Volodymyr Zelensky’s government remained in power. He thanked NATO states, especially the USA, for their military assistance and support, but he was unsatisfied. He asked for more and heavier weapons. A no-fly zone was brought up as well, but it did not receive support because it was unrealistic and impossible; Russia would never agree and NATO having to enforce it would likely result in direct confrontation (Edmondson and Shear 2022). In spite of the President’s dissatisfaction with military assistance, Ukrainian forces took advantage of the Russian rotation and began small counter-offensives on the Kherson, Kharkiv, and

Kyiv axes. In the following days, Russian forces defended their holdings around Kyiv by using elite units such as the VDV and suffered heavy losses because the lightly armored paratroopers faced heavy armor without artillery or air support (Urban 2022). On April 3, the Institute for Study of War declared the battle of Kyiv to be over as a Ukrainian victory (Kagan et al. 2022).

2.2. Phase 2: Donbas

Russia reconstituted its plans after the first month of the offensive. It was apparent that they did not have the manpower and logistical framework to support four different offensives with no cohesion between them. Forces from Kyiv and Kharkiv were transferred to the Donbas in preparation for a new offensive. In the meantime, Russian troops conducted smaller attacks targeting Rubizhne, Severodonetsk, Popasna, and Slovyansk. These attacks were often repelled and only came with minor territorial gains (Clark and Stepanenko 2022).

Mariupol, a large city on the northern bank of the Azov Sea, played a crucial role in Russia's plan to form a land bridge between Crimea and the Donbas. The city underwent relentless heavy artillery shelling and aerial bombing to make way street by street. By April 21, Russian forces had captured the southwestern port and asserted control over the whole city except the Azovstal Steel Plant complex (Clark et al. 2022b).

The Donbas offensive commenced on 18 April 2022. Large scale assaults were conducted on Rubizhne, Popasna, and Marinka, and assaults were complemented by heavy artillery barrages (Clark et al. 2022c). The new slower and methodical approach allowed Russian forces to make small gains by softening defenses with artillery and by progressing on parallel roads instead of only on major highways as they had done previously. Consequently, Russian troops made slow and steady advancements out of Izyum in multiple directions (Clark et al. 2022c). By May 7, Russian forces had been able to capture and hold Yampil, 40 km deep into Ukrainian territory. They also captured the strategically important city of Popasna. The objective of this offensive was to cut off Ukrainian forces in Severodonetsk and Lysychansk by encircling them, with Izyum and Popasna serving as the two prongs. The assault on the outskirts of Severodonetsk had begun the previous day (Hird et al. 2022f).

During April 2022, the presidents of several European states (e.g., Poland, Estonia) as well as members of the International Criminal Court visited Ukraine. Serious damage to residential housing and evidence of torture and mass killings were found. These atrocities were brought to the world's attention by the press (Schreck and Stashevskyi 2022). Soon leaders from Western European countries arrived in Kyiv as well. On April 8, Ursula von der Leyen, President of the European Commission, visited Kyiv and condemned Russia. A day later, Boris Johnson, then Prime Minister of the United Kingdom, made an unannounced visit to Ukraine and promised a new aid package that included armored vehicles and anti-ship missiles. This was an addition to the USD 130 million in high-grade military equipment—including anti-aircraft missiles and anti-tank missiles—announced the day before (Parker et al. 2022). The West promised Ukraine heavy weapons. Poland, for example, sent more than 200 tanks, which was a great number in proportion to the Polish tank stock (Oliemans and Mitzer 2022), but questions arose about how they were going to get to Ukraine.

The war made it impossible to ship military equipment by directly landing cargo planes in Kyiv. New routes had to be developed in order to keep circulation alive. The use of transport ships in the Black Sea was ruled out, as Russia firmly held control over it with their Black Sea Fleet and they occupied the strategically important Snake Island. Instead, the responsibility fell on Ukraine's eastern neighbors. The main artery became Rzeszów, a Polish city 100 km away from the Ukrainian border. The city fielded a small regional airport, which turned into a bustling hub of military logistics with multiple cargo planes landing every day. Equipment was loaded on convoys that made their way to Lviv on the highway (Powis 2022).

The missiles Boris Johnson promised may have played a role in deterring the Russian Baltic Fleet from even considering an amphibious assault. Previously, the fleet performed multiple demonstrations near Odessa with a lineup of both warships and landing ships (Sutton 2022). Only four days later, on April 13, the Baltic Fleet's flagship, the Moskva, was hit and foundered the following day. Moskva's sinking was attributed to two Ukrainian Neptune anti-ship missiles striking it amidship, causing a large explosion and subsequent fire (Polityuk and Kozhukhar 2022). With Moskva's loss, Russia was discouraged from further demonstrations and the possibility of an amphibious assault was ruled out. The missiles sent by the UK were UGM-84 Harpoons, which also played a role in deterrence for the future. In June, Harpoons were used to strike the armed tugboat, Vasily Bekh (Ozberk 2022), and several offshore oil drilling rigs (Krutov and Prince 2022).

The second phase of the war was defined by a much slower operation pace led by artillery. Previously dominating strategies based on maneuver warfare were replaced with static attrition warfare. Russian forces had a considerable advantage due to their overwhelming supply of artillery pieces and ammunition. In addition, focusing more units on one frontline alleviated their manpower issues (Kofman and Evans 2022a). This change had detrimental effects on the Ukrainian war effort. They themselves were using the same Soviet systems, but had fewer guns and less ammunition than the Russian forces. They also did not possess production capabilities to replenish them. Western heavy weapon aid was crucial for Ukraine to compete with Russian artillery superiority (Saxena 2022). In April, the U.S. Department of Defense announced the first dozens of 90 artillery guns that would prove to be the most important military assistance piece for the upcoming months (Lopez 2022). The M777 howitzer is a lightweight, towed, 155 mm artillery piece necessary for traversing the Ukrainian countryside in harsh conditions. Despite its light weight, its range is not sacrificed and it is capable of lobbing shells 30 km away. It also has quick setup and displacement times, which is crucial in avoiding counter-battery fire from enemy artillery. An on-board digital computer allows quick and accurate targeting and does not require central-fire control to be effective. Coupled with GPS-guided M982 Excalibur shells, the range increases to 40 km with spot-on accuracy for precision strikes (Army Recognition 2022b). The USA provided the largest share of these guns, with Canada and Australia contributing a few pieces as well. In May, Italy and Estonia sent an undisclosed number of FH-70 towed guns, which were older than the M777 but still a capable 155 mm piece. In July, the UK helped the cause with 36 L118 and L119 105 mm howitzers, which were of smaller caliber and shorter range, but being lightweight allowed good mobility. Ex-Eastern Bloc states provided a small amount of Soviet artillery pieces (Oliemans and Mitzer 2022). Towed guns, however, have one huge disadvantage: they lack mobility. Using them in modern symmetrical warfare is risky because they are susceptible to counter-battery fire and air strikes. Permanent artillery positions, therefore, are easy targets. The solution is putting the gun on a vehicle instead of towing it, thus cutting out placement and displacement times. The solution is a Self-Propelled Gun (SPG). Poland and Czechia were the first in April to provide Ukraine with SPGs, including more than 20 old Soviet 2S1 Gvozdikas and 20 modern Danas. The Netherlands stood out in Western Europe by being the first to send eight state-of-the-art Panzerhaubitze 2000s. They were followed by Germany only in June, with 14 donations and the purchase of 100 pieces. Apart from Gvozdikas, Poland donated 18 AHS Krabs and a further 54 were bought by Ukraine. France contributed 18 Caesars in May. By midsummer, Ukraine had had over 300 artillery guns donated by the West (Oliemans and Mitzer 2022).

Despite significant military assistance in terms of artillery, Russia still maintained 3:1 superiority with up to 20,000 shells fired per day in area-based fire missions. The goal was to level a designated zone with non-stop artillery barrages forcing the defenders to withdraw. This tactic was sufficient to make small gains without losses and the continuous shelling had a profound effect on the defenders' morale. Albeit the successes, this strategy was costly in ammunition and guns (Saxena 2022). Russia had a large stockpile, but ammunition is finite. Ukraine's strategy was to make up for Russian artillery superiority

by using precision strikes instead of area barrages. Counter-battery radar and guided shells enabled them to conduct accurate strikes against Russian artillery and other targets in small numbers. Despite the less wasteful strategy, Ukraine suffered from logistical issues as well in the form of running out of shells to fire. Stocks of old Soviet shells were depleted at an unsustainable rate, forcing NATO to scramble and search for shells in ex-Eastern Bloc member states. NATO artillery pieces were entirely reliant on ammunition and replacement parts provided in aid packages (O'Grady et al. 2022). The combination of these 300 donated and Ukraine's older artillery guns were not enough to gain the upper hand and stop Russian advances, but they did inflict sizable casualties.

Using mechanized warfare to advance requires a large quantity of armored and mobility vehicles. On the Kharkiv axis, Ukraine was on the advance and required more vehicles. NATO countries were keen on sending vehicles to support the offensive. The most numerous category was IMVs. These all-terrain vehicles did not require a long training course and their maintenance was relatively simple. Hundreds of Humvees joined those donated before the war. These Humvees would make up the brunt of the IMV force and they were joined by smaller numbers of vehicles sent by the UK, Poland, Canada, Norway, and Italy. Next came mine-resistant vehicles. These vehicles are built with a V shaped chassis bottom, which dissipates the force of a mine explosion off to the side to save the crew inside. They are often armored against small arms fire and also armed with light and heavy machine guns. An Armored Personnel Carrier (APC) is a vehicle capable of stopping small arms fire and is often tracked rather than wheeled. Ukraine received more than 300 M113 variants. One of these was a tracked system developed by the USA for the Vietnam War, which was made from aluminum. The USA donated 200 while the Netherlands, Denmark, Norway, and Portugal each sent dozens of variants. Such variants included mortar carriers, command post, and medical treatment vehicles. The UK provided FV103 Spartans while the French sent lighter wheeled VABs. Infantry Fighting Vehicles (IFVs) are armored vehicles for carrying infantry, but they also possess heavy firepower in the form of an autocannon or medium caliber gun. ATGMs are mounted on some types as well. Ukraine received over 200 BMP-1 variants from Czechia, Slovakia, Poland, and Greece. The UK sent an assortment of Armored Fighting Vehicles (AFVs), which were IFVs without infantry dismounts and served a combat fire support role. Close to 300 tanks were transferred from Polish, Czech, and Lithuanian stocks. All of these tanks were T-72 variants, which included older models such as the T-72As and T-72Ms, the latter of which possessed extra protection. Modern variants such as the T-72EA and Polish PT-91 Twardy featured more protection, an upgraded power plant, and digital optics (Oliemans and Mitzer 2022).

Poland and Czechia sent more than 40 Grad MLRS systems (Oliemans and Mitzer 2022), an old Soviet weapon developed in the 1960s that is regarded as obsolete by today's standards. With a 20 km range and poor accuracy, these systems had only a minor impact on the field, and Poland and Czechia were likely getting rid of systems that were more than past their half-lives. Both states donated variants of the original BM-21 configuration, but Czechia sent the RM-70 version with a modern chassis and an integrated fire control system. Ukrainians were familiar with the system, as they also possessed Grads (Army Recognition 2022a).

In May, Joe Biden announced a package coming with a weapon system expected to change the war. Ukraine was pleading more for no other system as they were struggling to stall Russian advances in the Donbas region. After training, the first set of M142 High Mobility Artillery Rocket Systems (HIMARS)—a light wheeled multiple rocket launcher—made its way to Ukraine on June 1 (Gould 2022). It is armed with six 227 mm missiles with a range of 70–80 km. These missiles are GPS guided, enabling precision strikes on targets. The combination of range and accuracy allowed strikes deep behind the frontline aimed at supply hubs and command posts. Russia already suffered from attacks on their logistics infrastructure from artillery fire and in rare cases short-range ballistic missile attacks. They were reluctant to move them back further, as that would elongate the line between supply depots and the frontline. The HIMARS's extended range over barrel artillery posed a great

threat to Russian logistics. Ukrainian forces now had the tool and painted targets with the help of Western intelligence. They targeted Russian logistics, with multiple supply depots going up in flames every night. The problem was exacerbated by negligence and improper storing of ammunition. Large amounts of munitions and fuel being dumped in close proximity is a recipe for disaster. Critical infrastructure, such as bridges, was also struck. Russian air defenses were not capable of dealing with HIMARS. This was due to salvos of missiles simply overwhelming defenses and such attacks being masked with larger inaccurate Tochka short-range ballistic missiles. Russian forces did not have a sure way of destroying these systems. Ukraine kept them mobile and hidden, so a ballistic missile attack was ruled out. Airstrikes were not possible either because air defenses were intact and airspace was contested (Ponomarenko 2022c). In July, the UK donated six M270s (Oliemans and Mitzer 2022), which is the original version of the system on a tracked chassis and with two pods for a total of 12 missiles. The M142 HIMARS is a lighter variant with only one pod on a truck chassis (Ismay 2022).

Western aid in the second phase of the war was very significant. The influx of heavy weaponry made a big difference on the field. Silencing Russian artillery was the most crucial task and the West provided both direct and indirect methods for Ukraine. M777s and other artillery pieces coupled with counter-battery fire could duel enemy artillery and destroy guns. They could also target military vehicles and infantry. The HIMARS and M270 were the most important elements of military assistance to Ukraine. They posed a major threat to Russian forces who lacked an effective counter against them and they exploited the weaker links of their logistics. They forced Russian forces to pick and choose which artillery unit could receive ammunition because they simply could not supply all. They weakened Russia's biggest advantage, which was heavy artillery. If weapon systems had to be dubbed as 'game changers', then this title would definitely be awarded to the HIMARS and M270. However, it has to be noted that these systems were not a Death Star. They had a specific role and purpose on the battlefield, which they performed well. They had a significant effect on the battlefield, but they did not destroy the whole Russian army and win the war on their own.

On April 18, Russia declared the start of a new major offensive. Plans for encirclement included capturing Bakhmut, Kramatorsk, and Sloviansk (Clark et al. 2022c). Due to the low number of troops committed to the offensive and because many units could not restock after heavy losses suffered on the Kyiv and Kharkiv axes as a result of the insufficient pause, the offensive was not expected to come with any quick breakthroughs. Concentrated artillery barrage led the way for marginal positional improvements. Regardless of the new slower approach, the offensive had stalled by the end of April. The Ukrainian counter-offensive on the Kharkiv axis was a cause of concern for the Russian forces, requiring more units to be stationed up north instead of at the Donbas (Hird et al. 2022g). Realizing the stagnant state of the offensive in mid-May, the goals were scaled down and solely focused on Severodonetsk and Lysychansk (Stepanenko et al. 2022a). Fighting for these two cities was disadvantageous for the Ukrainian forces, as they were partially surrounded both north and east. Russia managed to make incremental gains from Popasna and captured several settlements around Severodonetsk and Lysychansk. Despite the daunting prospect of urban combat, the Russian forces began their assault in the city of Severodonetsk on May 27 without adequate preparation and complete encirclement (Stepanenko and Clark 2022). Intensive urban warfare was characterized by a series of attacks and counterattacks, with both sides suffering heavy losses. After two months of grueling fighting for Severodonetsk and heavy losses, Ukraine ordered a withdrawal from the city on June 24 (Stepanenko et al. 2022f). Lysychansk was abandoned a week later on July 2 (Stepanenko et al. 2022c). With the fall of both cities, Russia claimed victory over Luhansk Oblast, but the question arose whether Russia was going to be capable of continuing the offensive or whether they were going to order another operational pause to replenish their forces after suffering heavy losses. They were also facing growing Ukrainian counter-offensives supported by Western heavy weaponry on the Kherson and Kharkiv axes.

2.3. Phase 3: Counter-Offensives

The Russian offensive for the Donbas culminated with the fall of Severodonetsk and Lysychansk. In the days after, an operational pause was declared to give some breathing room for the troops (Hird et al. 2022a). Russian forces were exhausted from the hard fighting in Severodonetsk and were facing serious replenishment issues. This pause was also important for the Ukrainian forces as they too suffered heavy losses in Severodonetsk. However, replenishment was much easier compared to their counterpart, as adequate manpower was provided by mobilized and reserve units who received training with the help of advisors or attended training camps in Western nations. More heavy weaponry also made its way with a steady supply of ammunition (Oliemans and Mitzer 2022; U.S. Department of Defense 2022).

After a two-week long operational pause, Russia restarted the offensive at a much lower intensity on July 16. Probing attacks met resistance at Siversk, only making incremental gains. Essentially, the renewed offensive stalled and did not have nearly as much momentum as the previous one (Hird et al. 2022c).

During the fight for the Donbas, Ukrainian forces on the Kherson and Kharkiv axes had minor but steady gains in June and July. Kharkiv's outskirts were recaptured and the frontline was driven back in the most western corner to the Russian border. The Kherson counter-offensive was successful, as Ukraine captured the imminent area of Mykolaiv and crossed the Inhulets River. Kherson was a hard position to defend for the Russian forces because of the Dnipro River. Supply routes were limited to a few bridges that came under artillery and HIMARS fire. The Antonovskiy Bridge in the city of Kherson was damaged by consecutive HIMARS strikes. Pontoon bridges and ferries were established to make up for the temporary loss of the bridge as engineers scrambled to patch it. On July 24, Ukrainian officials put an emphasis on the Kherson offensive, which was supported by strikes against strategic Russian targets and generally elevated activity on the frontline. The satellite imagery of National Aeronautics and Space Administration (NASA) showed a decrease in Russian strikes and an increase in Ukrainian artillery strikes (Hird et al. 2022d). Contrary to the Ukrainian announcement in July, their forces could not achieve a major breakthrough, only slow inching towards Kherson. Their strategy focused on causing as much damage to Russia's logistics infrastructure as possible. Bridges across the Dnipro River were damaged beyond repair, with the Antonovskiy Bridge absorbing even more missile salvos. The last functioning bridge at the Nova Kakhovka hydroelectric dam was disabled on August 12 (Wright 2022). The rest of August resumed with multiple failed Russian attempts around Bakhmut and Ukrainian HIMARS strikes against command bases, supply depots, and pontoon bridges in Kherson. On August 29, Ukrainian officials announced the Kherson counter-offensive again and declared operational silence. Ukrainian forces continued carrying out strikes against Russian logistics, weakening the combat capability and reinforcement of troops on the Kherson axis. They also made small territorial progress by recapturing a few settlements (Stepanenko et al. 2022b).

Ukrainian forces began a sudden large-scale offensive on the Kharkiv axis on September 6. Russian intelligence failed to predict an offensive, as there were no signs of defensive preparation and reinforcement leading up to the attack. Their forces were also preoccupied with Kherson and Bakhmut where they concentrated most of their troops. As a result of this, the Russian forces were stretched thin and consisted mostly of reserves (Kofman and Evans 2022b). The small Kharkiv axis garrisons combined with the shock factor of the attack led to Ukrainian forces advancing as much as 20 km per day (Hird et al. 2022b). Western equipment played a crucial role in the offensive. Western light and armored IMVs, such as Humvees, led the way into undermanned and shocked Russian defenses. Defenders could not mount an effective resistance and Russian lines fell into disarray. In a few days, the defenders went into mass rout and many were left in isolated pockets without communication or reinforcements. On September 9, Kupiansk became contested and the strategically important city of Izyum, which served as the northern staging area for Russia's Donbas offensive, fell without much resistance the following day. Ukrainian

forces asserted full control over Kupyansk on September 12. The Kremlin acknowledged the catastrophic outcome of the Kharkiv offensive (Stepanenko et al. 2022d).

Ukrainian forces continued the Kharkiv offensive with the capture of Lyman and crossing of the Oskil River in late September. It culminated with taking settlements around Lyman and a small stretch of the Svatove-Kreminna highway (Stepanenko et al. 2022e). On October 8, a major explosion severely damaged the Kerch Bridge connecting Russia and Crimea (Dougherty et al. 2022). Two days later, on October 10, Vladimir Putin ordered a massive missile strike of over 20 cities in Ukraine to retaliate for the Kerch Bridge attack (Beaumont et al. 2022). Aside from attacks on civilians, the strike unveiled Russia's new strategy of targeting the power grid all over the country. Strikes on infrastructure were not only performed by Russia's missile arsenal but also by newly acquired drones bought from Iran (Ellyatt 2022). Air-defense systems, therefore, became crucial for Ukraine. Due to Western military aid, Ukraine possessed air-defense systems from long range, such as the S-300, through mid range, with Buk, Strela, and Osa, to short range, covered by MANPADS. Despite the layered Surface-to-Air Missile (SAM) coverage, it was limited and could be overwhelmed by a major attack. Ukraine had a limited stockpile of Soviet-era air-defense systems and was unable to produce more of these weapons (Khurshudyan 2022). Dwindling numbers of Soviet air-defense weapons also posed the threat of Russia gaining the upper hand in the air. Although the Russian Air Force took a more cautious approach after the initial stage of the war, gaps in Ukrainian air defense could have allowed for greater operational mobility (Bronk et al. 2022). To solve this problem, NATO states pledged mid-range air-defense systems. Germany delivered four IRIS-T SLM systems, for instance. The USA pledged eight NASAMS batteries. Spain assured the delivery of older HAWK missile systems and Aspide batteries. France promised Crotale missile systems for shorter range interceptions. Earlier in the war, Germany delivered 30 Gepard Self-Propelled Anti-Aircraft Gun (SPAAG) units that used conventional guns for short-range air denial (Oliemans and Mitzer 2022).

In mid-December, the U.S. Department of Defense pledged to transfer a Patriot missile system to Ukraine. The Patriot is the American equivalent of the Russian S-300 and S-400 systems. The long-range missile is a formidable air-defense tool with a large area of coverage, but multiple questions arose. Firstly, the training and transfer time of the system. The training course for operators would last for months, which would be further delayed by having to transfer Ukrainian troops to the USA and then send them back with the system. Secondly, its capabilities. The USA has historically relied on its Air Force to achieve air superiority, making ground-based air-defense systems non-essential in most of their operations. This means the Patriot missile system had not seen extensive use. The system had received upgrades, such as better radar and integration into the defense system against intercontinental ballistic missiles; however, it was limited in the number of missiles it could launch to intercept targets and it could be easily overwhelmed by missile salvos. Lastly, cost-wise, the missile is expensive at USD 4 million per piece. Interception of a cruise or ballistic missile could be justified by comparing the cost of damage that would have occurred without interception, but shooting down a USD 50,000 Iranian drone is an immense waste of resources (Cancian and Karako 2022).

The USA also pledged Sea Sparrow missiles with a rather creative launch method. The Sea Sparrow is a mid-range air-defense missile used mainly on US warships. Ukraine does not possess such ships, so the choice for a launch platform fell on the Soviet Buk air-defense system, which uses the same technology as the Sea Sparrow and enables integration (Seligman and McLeary 2023). This was not the first time such a 'Frankenstein' weapon system was created in the war, as the USA previously sent HARM anti-radiation missiles, which were equipped on Mig-29 and Su-27 planes. These missiles were used to destroy radar installations, damaging Russian air-detection and -defense (Kadam 2022).

Despite the large variety and good capabilities of these air-defense systems, their limited numbers lacked the power to considerably improve the interception rate. Most of these systems were mid-range, meaning their coverage was small and multiple systems

were required to defend a single city. The combination of a small stock of systems and multiple cities to defend across the country was not nearly enough to stop the threat of Russian missile and drone salvos, many of which reached their target unimpeded. As an example of such an attack was the horrific strike on a Dnipro apartment block on January 14, causing the death of more than 30 civilians (Koshiw 2023).

As for the Kherson axis, it saw some rapid changes in October. Western-provided HIMARS and artillery bombardment were still present, and Ukraine managed to achieve artillery supremacy because the Russian forces could not resupply with bridges serving their logistical routes severed (Barros et al. 2022). In early November, the Russian army opted to withdraw from the city instead of defending it. Ukrainian forces moved into Kherson's center on November 11 and assessed complete control over the west bank of Dnipro (Hird et al. 2022e).

On the other side of the frontline, the city of Bakhmut became the next objective for the Russian forces after the capture of Severodonetsk and Lysychansk. First attempts on the outskirts of the city were made in late summer, attacks resumed in early autumn, and the offensive had intensified by November. On January 12, Russian forces captured Soledar, north-east of Bakhmut (Stepanenko et al. 2023). For the rest of January and February, Russian forces continued their offensive in Bakhmut and made marginal territorial gains (Bailey et al. 2023).

During the war, the West had been rather reluctant to send their best vehicles. The overwhelming majority of Western vehicles donated were IMVs and mine-resistant vehicles. On the lightly armored side, they provided legacy systems well past their prime, such as M113s, Spartans, and VABs. The heavier IFVs and tanks donated were strictly of Eastern Bloc origin (Oliemans and Mitzer 2022). Nevertheless, the West had a change of heart in early January as multiple states stepped up and pledged heavier vehicles. The first was France with the AMX-10 AFV, a lightly armored wheeled chassis armed with a 105 mm gun. The combination of mobility and firepower makes it a formidable platform, although it is susceptible to enemy fire due to a lack of proper armor (Caulcutt 2023). Germany was next in line with their Marder 1A3 IFVs (Mansoor 2023). Lastly, the USA provided M2 Bradley IFVs. Out of the three systems, the Bradley IFV is the most heavily armored and possesses both a 25 mm autocannon for lightly armored targets and a Tube-launched Optically-tracked Wire-guided (TOW) missile against heavy targets. This is also the youngest of the three systems and serves as the backbone of the USA's IFV fleet (Mansoor 2023). In early November, the USA also pledged M1117 IFVs, but there was no evidence of them reaching Ukraine as of February 27 (Oliemans and Mitzer 2022). Sweden stepped up as well, with the pledge of 50 CV90 IFVs (Oliemans and Mitzer 2022), whereas Estonia went all in by promising to send all of their towed 155 mm artillery pieces, accounting for 24 FH70 howitzers (Saballa 2023).

Tanks were a touchy subject during the war. After a lot of deliberation and discussion around the topic and with the war escalating, the UK was the first to provide modern Western tanks. A total of 14 Challenger 2 tanks were offered to Ukraine. Among others, Poland and Germany pledged Leopard tanks to Ukraine in January, and the Polish delivery began in February 2023 (Oliemans and Mitzer 2022). Finland also considered including Leopard 2s in their next aid package to Ukraine (Sorgi 2023). Spain, Portugal, Norway, and the Netherlands also expressed their desire to supply Leopards. One of Germany's criteria for permitting the transfer, as Leopards cannot be transferred to other states without the consent of the German government, was commitment from the USA, which they received. The USA pledged 31 Abrams tanks right after receiving German permission. Nevertheless, these tanks had not been delivered as of 27 February (Oliemans and Mitzer 2022). In addition, none of the NATO member states had yet agreed to requests from Ukraine to send fighter jets, fearing that they might be drawn further into the war if Ukraine used their fighter jets to attack targets inside Russia (Brown et al. 2023).

3. Discussion

Ukraine is wedged right between the East and West by being an ex-Soviet state gaining independence with neutral standing between the two political spheres. Serving this role as a buffer state, it was important for both sides to try to sway Ukraine, as Russia did with Belarus. In the twenty-first century, Ukraine was closely aligned with the European Union, but later, pro-Russian President Viktor Yanukovich was elected and he decided to not sign the EU–Ukraine Association Agreement, which induced protests that turned to revolution in 2014. The political failure of Yanukovich prompted Russia to invade and annex Crimea, founding the Donbas revolution. Both actions were a violation of the Budapest Memorandum (Hamilton 2019). Subsequently, both NATO and the EU, after some initial debates, supported Ukraine not only because it was attacked, but also because it was just as important to them as it was to Russia. This tug of war decides who holds absolute control over Eastern Europe. With Ukraine under Petro Poroshenko and Volodymyr Zelensky favoring the West because of Russia's aggression, they also saw an ally and potential member of both organizations. Consequently, as Hamilton (2019, p. 11) stated, "Russia is the external actor that bears primary responsibility for the war, but the West—both wittingly and unwittingly—contributed to its outbreak".

The West, therefore, provided military support to help Ukraine due to the above-mentioned possible future prospects and because they could essentially trade weapons to weaken Russia, which benefited them. NATO played carefully by not sending troops into Ukraine, which would lead to a direct confrontation with Russia, but it did the most to help Ukraine. Nevertheless, military assistance was associated with the risk of an aggressive reaction from Russia, which was the main reason why almost no considerable aid was provided to Ukraine until February 2022 when a Russian invasion was materializing.

The military assistance to Ukraine from Western states and international organizations such as NATO and EU, however, began cautiously at the very beginning and even during the first phase of the Russo-Ukrainian war, as only non-lethal and mostly defensive-nature weapons were provided. The USA was the first to provide non-lethal military aid to Ukraine in 2014, including equipment for soldiers and support equipment. In 2018, it was the USA again who first sent lethal weapons, namely Javelin launchers and missiles to Ukraine. Nevertheless, until 2022, Ukraine mostly received security assistance packages to increase its defensive capabilities. Due to the rising tensions from Russia in early 2022, more NATO member states agreed to provide military assistance to Ukraine, but these packages only included small arms, anti-tank weapons, and MANPADs, with no heavy weapons or vehicles. The UK was an exception since it supplied lethal weaponry to Ukraine in January 2022.

Although all the weapons Ukraine received in the first phase of the war from NATO member states, especially the USA, had good capabilities, they were not seen as 'game changers'. They showed effectiveness in combat but did not have a great enough influence to have a major impact on the war, especially to escalate the conflict with Russia, for many reasons, but mainly because of their defensive nature. However, AT weapons and MANPADs enabled Ukrainian forces to form a capable resistance, maintain Ukraine's existence, as well as counterbalance the losses sustained.

In the second phase of the Russo-Ukrainian war, static trench warfare defined by non-stop artillery barrages and duels took place in the Donbas. Consequently, military assistance provided to Ukraine at this phase included anti-tank, anti-ship, and anti-aircraft missiles. Towed artillery, mainly M777 howitzers as well as self-propelled guns such as Gvozdikas, Danas, and Panzerhaubitzen, were sent by the USA, UK, Poland, Czechia, the Netherlands, Germany, and other NATO and EU member states. Although towed guns lack mobility, this disadvantage was compensated by SPGs. These artillery guns, therefore, proved to be highly significant military aids sent to Ukraine, as they played crucial roles in deterring Russian forces from amphibious operations as well as targeting infantry, for instance. In addition to artillery guns, the weapon system Ukraine had longed for, the HIMARS rocket launcher, was pledged by the USA in May 2022. In addition to this, other

multiple rocket launchers, such as the M270 and Grads, were also provided by the UK, Poland, and Czechia.

As a result, it can be stated that Western military assistance in the second phase of the war was very significant. Heavy weaponry enabled Ukrainian forces to duel enemy artillery and also target military vehicles and infantry. The HIMARS and M270 were considered to be the most significant systems, as they could deal strategic damage by targeting supply and ammunition depots as well as command posts. Consequently, these systems were seen as 'game changers', although they could not win the war for Ukraine on their own. Thus, Ukraine still lacked the Western weaponry and equipment needed to achieve a pivotal advantage to win the war.

The third phase of the war, characterized by Ukrainian counter-offensives, capitalized on the exhaustion of Russian forces and undermanned frontlines during which Ukrainian forces received military assistance in the form of training in Western camps. Additionally, more heavy weaponry as well as ammunition was also provided to Ukraine. NATO states, for example, pledged mid-range air-defense systems such as NASAMS batteries, IRIS-T SLM systems, and HAWK missiles. Furthermore, the USA promised Patriot and Sea Sparrow missiles to Ukraine. These air-defense systems played a crucial role in fighting against Russia's bombing campaign on critical infrastructure and residential buildings. In spite of this, it can be stated that during the war, Western states were rather unwilling to send their best vehicles and they mainly offered IMVs and mine-resistant vehicles. The heavier IFVs and tanks were of Eastern Bloc origin. Tanks, however, were a sensitive topic during the war. Following some considerations and negotiations, it was the UK who first provided modern Western tanks, followed by Poland, Germany, and the USA, and later by many other NATO and EU member states. Contrary to tanks, fighter jets, which were longed for by Ukraine, were not sent to Ukraine by any of the NATO states to avoid potential further escalation of the war.

In view of the military assistance provided by Western states, it can be seen that the top contributors were the USA, UK, Poland, and Germany. It can also be stated that Ukraine received both old and new equipment. This military assistance, therefore, had a significant impact on the Russo-Ukrainian war, as Ukraine was able to persist and even launch counter-offensives, which they could not have done otherwise.

Based on the above, in response to the research question of the paper, it was found that the weapon systems provided to Ukraine by Western states and international organizations had a profound effect in swaying the war, as Ukrainian forces may not have persisted without them. The HIMARS and M270 were found to be 'game changers', since to some extent they changed the course of the war for Ukraine from only suffering offensives to being able to launch counter-offensives. However, it must be noted that Ukraine still needs strong support from international coalitions to bring this war to an end ([Danylyuk 2022](#)).

4. Conclusions

The paper investigated the significance of the military assistance provided to Ukraine. It answered the question of how significant a role the NATO-provided weapon systems played in the war. Western military assistance was found to be very significant, with combinations of systems slightly swaying the war in respective phases, and the HIMARS stood out as the single most important weapon system. The HIMARS addressed the issue of drone and missile attacks, which was a partial solution, along with the bold move of providing modern Western tanks and armored vehicles.

The paper faced some limitations in the form of genuine information being scarce due to misinformation and disinformation being published by both sides of the conflict. Further limitations included the sole use of open source materials and analyses as the fog of war is shrouded in layers of secrecy and operational security.

For the future, there is much to be elaborated on in greater detail. The war changes on a daily basis and an update is required with such rapid changes of events. Hindsight would also give a better ground for analysis, as nothing is certain but the past.

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